

CHARACTERISTICS OF ENERGY DRINK CONSUMPTION AMONG ADOLESCENTS FROM SOUTHERN POLAND

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Abstract

Energy drinks are intended to raise the psycho-physical ability of the body. Their impact on the health of young people has not been well researched.

The study was carried out in a group 514 secondary school students aged 16 - 18 years from Southern Poland. Adolescents were from two environmental - rural and urban. The research tool was authors, anonymous questionnaire with questions about consumption of energy drinks. The current assessment of the nutritional status of students included body height and mass measurements. U Mann-Whitney's test was used to differentiate between groups due to gender and places of residence. The study involved 214 students from rural areas and 277 from the city. Most of the study population was girls (265 vs 253 boys).

Nearly 73% of the subjects had a normal body mass index according to BMI. The vast majority of the surveyed adolescents reported energy drinks consumption (89.2%), most often less than once in a week (21.2%). More often, energy drinks drank students from the urban area ($p = 0.0120$) and in gender group boys ($p = 0.0037$). The main reason consumption of energy drinks was reduction in sleepiness (44.2%). Most of the students (55.5%) chose the drink of quantity 250 - 330 mL (55.5%), less than 5% of one liters and more. The most common symptoms after consuming were: improve energy (42.0%), sleepiness (22.0%) and palpitations (8.5%). Energy drinks in combination with alcohol and cigarettes of 21% and 20% of respondents, were tried. According to 29.3% of young people who drank energy drinks, they can be hazardous to health. In the opinion of 7.7% of the respondents security determines the amount of consumption.

The prevalence of energy drinks among young people is high despite the knowledge of the danger of their consumption. There is a need to monitoring and education to build healthy nutritional behaviors.

Key words: Energy drinks, Adolescents, Nutritional behaviors, Rural region, Urban region.

1. Introduction

Intake of water and other drinks is an integral component of the diet. In recent years, the problem seems to be the structure of the consumption of beverages and their relationships with the development of overweight and obesity. As shown by the meta-analysis conducted by Morenga *et al.*, consumption by children and adolescents sugary drinks is associated with overweight and obesity [1]. Energy drinks are belonging to the category of products contain from 4.27 to 43.09 g/250 ml of sugar. On average, in the popular energy drink cans is 33.45 g of sugar. According to the authors of the cited study, this is about 31% of the daily intake of sugar by a statistical pole [2]. Energy drinks are non-alcoholic products, which are available on the European market since the 90 years [3]. Effects of energy drinks on weight gain of young people has already been confirmed in the study [4, 5] and constitutes an important challenge to public health, by contributing to the development of obesity in Poland and in the world. Indicates to other potential effects of consumption of these drinks, which may relate to cardiovascular health, attention deficit hyperactivity syndrome (ADHS), nutrition disorders, bone mineralization process and sleep disorders [6].

In energy drinks the main source of energy, are not carbohydrates but other stimulant substances, which include: caffeine (the main ingredient), taurine, vitamins of B group, gluconolactone and other, depending on the manufacturer. Hence the purpose of the energy drinks, which is to raise the efficiency of the psycho-physical organism [7]. Caffeine, which is the primary ingredient in energy drinks, is also the most common on excitatory substance. Caffeine stimulates the nervous system, affects the same to: improve cognitive function, increases alertness, removes the drowsiness, and fatigue [8, and 9]. The body's reaction to caffeine intake, is caused by a number of factors, *inter alia*, dose and body weight [9], which is of particular importance in the case of children and youth. For adults, the main source of caffeine in diet is coffee, whilst for teens this is a drink that contains caffeine [10]. Energy drinks contain an average 80 mg per 250 mL [11].

Moderate caffeine intake to 5 cups a day, has been confirmed in studies as beneficial to health [12]. According to a report by the European Food Safety Authority (EFSA) from 2015 safe caffeine intake for adults is to 400 mg per day. In the same report, we can find that: *"For children and adolescents, the information available is insufficient to derive a safe caffeine intake"* [13]. In Poland also, the recommendations of the Institute of Food and Nutrition, are do not take into account caffeine in the diet of children and adolescents. Changes on the nutrition of children in educational establishments in 2015, initially also prohibit the sale of coffee and other sweetened drinks, in this caffeine-containing in school, but in the light of the new provisions of the 2016 admitted the possibility of buying in school infusions of coffee [14]. In EFSA report, average caffeine exposure from energy drinks in a group of adolescents was from 16 mg/day to 75 mg/day. But from the all products with content caffeine it was from 150 mg/day to 477 mg/day, with an average caffeine exposure for energy drinks consumers - 185 mg/day. In Poland, in the same report the chronic exposure to caffeine from energy drinks was 16.2 mg/day and 171.44 mg/day from all sources of caffeine [15].

In addition to caffeine, as a popular ingredient, in energy drinks is taurine. It affects the development of the central nervous system, and stimulates [8, 9]. The content of this amino acid in energy drinks on the European market is from 28 mg/L to 4000 mg/L [15]. The level dose of Not Observable Adverse Effects Level (NOAEL) for taurine according to EFSA in 2009 is 1000 mg/kg body weight per day [16]. Among European teenagers who consume energy drinks, the average intake of taurine from such products amounted to 283.9 mg/day, in the group consuming the largest amount of this drink was 924.3 mg/day [15].

Energy drinks market is growing, and among customers, half are children and young people [6]. So far a

safe level of consumption of energy drinks by this age group is not specified [6]. Energy drinks packaging in addition to classic tins containing 250 - 330 mL of this drink, it's also, called. "Energy shots" - which have concentrated sources of active ingredients (e.g. caffeine and taurine) [17]. The more dangerous is that are a larger package - 500 mL or even 1000 mL and more, so in a single package contained more active substances. Consumption of such large amounts of energy drinks may be a threat to the life and health of the young people.

The aim of the study was to know the behaviour of young people associated with the consumption of energy drinks among teenagers from the southern Poland.

2. Material and Methods

The study was conducted between February 2014 and May 2015 (consent of the Ethics Committee UJ-KBET/62/B/2013). In total, 514 people aged 16 - 20 years were involved in the study. The study including 253 boys and 265 girls. Pupils were residents of two voivodeships - Podkarpackie and Małopolska. Among the study participants - 277 people came from Małopolska and 241 from the Podkarpackie province. Those regions are different because of historically geographical situation and industry development. However just now this differences are not so important. Approximately 60% of the study participants indicated the village as the current place of residence.

Research tool was an anonymous frequency questionnaire of consumption of selected products and beverages (FFQ), prepared in paper and electronic version by using Microsoft Office - MS Excel 2013 (UJ). The questionnaire is consistent with the guidelines of the Scientific Committee on Human Nutrition of the Polish Academy of Sciences [18]. The questionnaire consisted of a total 41 multiple choice closed-type questions. In the first part of the survey were questions about socio-demographic situation of the adolescents in the other there were 27 questions, about the consumption of energy drinks. This section was based on research tool of EFSA, for teenage aged 10 - 18 years concerning the behaviours associated with the consumption of energy drinks. Questions were associated with: criteria for a decision relating to the purchase of drink and the preferred brand of energy drinks, the place of purchase, motivation, volume energy drink purchase most often and intake throughout the day, the selected symptoms that occur after consuming energy drinks.

The FFQ questionnaire [19], developed at the Department of Human Nutrition at the Jagiellonian University was used to assess the frequency of food product consumption, among them including energy drinks.

Consumption frequency of beverage was presented at a seven-step scale. Students indicated only one possible answer (never, once a month or less, 2 - 3 times a month, less than once a week, once a week, several times a week, daily or several times a day).

To analyse the collected qualitative data between the distinguished groups, taking into account the place of residence and gender, non-parametric U Mann-Whitney test was used. The level of statistical significance $\alpha = 0.05$ was used. Statistical calculations were performed in Statistica PL 10.0 (UJ license).

3. Results and Discussion

The average age of study group (514 subjects) was 17.15 ± 0.60 years, youngest participant was 16 year-old and the oldest 19.5 year old. Students of the Podkarpackie province were significantly older than students from Malopolska [Podkarpacie (P): 17.29 ± 0.64 years vs. Malopolska (M): 17.02 ± 0.54 years vs. $p < 0.0001$. The study involved in total, more girls (G: 51.2%) than boys (B: 48.8%). Close to 60% of the study participants, as they current place of residence indicated rural area, in city lived 40.4% of respondents overall. More in city lived students from Malopolska (58.5%) than the Podkarpacie (19.1%). The majority of respondents had siblings (85.9%).

The frequency of consumption of selected non-alcoholic beverages in the study group in general and taking into account the place of residence and gender was collected in Table 1. Mostly young people in Southern Poland drank mineral water, fruit juices and sweet carbonated beverages, least isotonic and light drinks. The statistically significant differences were in the consumption of beverages in groups of residence, where the inhabitants of the countryside drank fruit juices more often, whereas in the cities - water, cola drinks, isotonic and energizing drinks. Also in the gender groups, boys were more likely to drink sodas, colas and energy and isotonic drinks (Table 1). Research from 13 countries on the assessment of water and other drink consumption showed that children and adolescents regularly drink sweet drinks. In the group of young people from Poland in the light of these studies, the share of sweet drinks - including energy drinks in total consumption of drinks and water was respectively - in the group of girls 20% and boys 23%. The largest percentage of the surveyed boys (33%) and girls (35%) drank hot beverages. Water in the structure of teenage consumption was 23% for girls and 20% for boys [20].

The prevalence of consumption in the study group of energy drink was 89.2% of total youth. Never tried this type of drink 8.5% of the students from the survey. Boys (2.88 ± 0.46) were more likely to drink energy drinks

Table 1. Frequency of consumption of selected soft drinks in the study group and taking into account the place of residence and gender

Types of drinks	Mean \pm standard deviation ($X \pm SD$), Median (Me)									
	Total N = 518	Me	Podkarpacie N = 241	Me	Małopolska N = 277	Me	Boys N = 253	Me	Girls N = 265	Me
Mineral water	6.39 \pm 1.15	7	6.24 \pm 1.23*	7	6.52 \pm 1.07*	7	6.41 \pm 1.11	7	6.38 \pm 1.19	7
Fruit juice	5.53 \pm 1.31	6	5.75 \pm 1.15*	6	5.34 \pm 1.41*	6	5.47 \pm 1.29	6	5.58 \pm 1.33	6
Sparkling sweet drink	4.25 \pm 1.83	5	4.24 \pm 1.85	5	4.26 \pm 1.82	5	4.50 \pm 1.79*	5	4.00 \pm 1.84*	4
Beverage, type Cola drink	4.08 \pm 1.70	4	3.88 \pm 1.67*	4	4.25 \pm 1.70*	4	4.36 \pm 1.66*	5	3.81 \pm 1.69*	4
Vegetable juice	2.85 \pm 1.78	2	2.95 \pm 1.83	3	2.76 \pm 1.73	2	2.90 \pm 1.76	3	2.80 \pm 1.79	2
Energy Drink	2.80 \pm 1.68	2	2.59 \pm 1.64*	2	2.97 \pm 1.69*	3	3.08 \pm 1.75*	3	2.52 \pm 1.56*	2
Isotonic drink	2.41 \pm 1.57	2	2.09 \pm 1.42*	2	2.69 \pm 1.63*	2	2.89 \pm 1.67*	3	1.95 \pm 1.31*	1
Beverage, type cola light	2.28 \pm 1.59	2	2.36 \pm 1.56	2	2.22 \pm 1.61	1	2.31 \pm 1.64	1	2.25 \pm 1.54	2
Energy drink, light	1.98 \pm 1.44	1	1.90 \pm 1.37	1	2.04 \pm 1.50	1	1.96 \pm 1.44	1	2.00 \pm 1.44	1

* $P < 0.05$ statistically significant difference. N - number of participants;

Frequency of consumption: 1 - never, 2 - once a month or less, 3 - 2 - 3 times a month, 4 - less than once a week, 5 - once a week, 6 - several times a week, 7 - every day or several times a day.

than girls (2.74 ± 0.65 ; $p = 0.0037$). They were less likely than once a week to drink, less than 1% of the participant drank them every day. Significant differences were found in the frequency of energy drink consumption among the study boys and girls (B: 3.08 ± 1.75 vs. G: 2.52 ± 1.56 , $p = 0.0003$). The girls most often drank energy drinks once a month (21.9%) and boys less than once a week (25.3%). Young people in Malopolska also drank energy drinks significantly more often (M: 2.97 ± 1.69 vs. P: 2.59 ± 1.64 , $p = 0.0120$) than their peers from Podkarpacie. In the study of Bashir *et al.*, among young people aged 12 - 18 years, at least once a month, energy drinkers drank 33% of the respondents. At the same time they were more likely to be involved in high-risk behaviours, and more likely to consume other caffeinated drinks [21]. Whenever, energy drinks drank 73.6% of young Canadians aged 12 - 24 years [22]. In the population of young Europeans (10 - 18 years), the prevalence of consumption of this type of beverages was 86%, and among the surveyed Polish adolescents it was 73%. It was more often observed in adolescents group aged 15 - 18 years (73%) than in the younger age group 10 - 14 years (55%). Boys more often consumed energy drinks (74% vs. 63%) than girls, as confirmed by own studies [15] and in Canada [22].

Advertising was the main source of information about energy drinks (35.1%) and peers (22.2%). Advertising was also the main source of information in a group of boys (37.5%) and girls (32.8%). The least popular answer was the trainer-as a source of information about energy drinks (0.9% of the total, 1.9% of the boys and no girls). Statistically significant differences in the distribution of responses to the question about the source of information about energy drinks were reported between subjects from Podkarpackie and Malopolska region ($p < 0.0001$). For young residents of the Podkarpacie region more often (36.1%) source of information was peers (colleagues), than for Malopolska region (20.3%). Among students aged 11 - 16 years of research Cichocki *et al.*, advertising was also the most frequently indicated as the source of the information (about 60%). At the second place were peers - 30% [23].

Place of purchase energy drinks were mostly small shops in housing estates (89.5%). In newsstand energy drinks purchased 1.5% of respondents in other places e.g. bars/restaurants 0.5% of respondents. Similar structure of the response indicated in gender groups, that such drinks were purchased in small shops - 88.6% boys and 90.6% girls. Both students of the Podkarpacie region (88.9%) and from Malopolska region (90.1%), most energy drinks purchased in small shops housing estates. Among young people from the North Poles at the age of 12 - 18 years (average 15.8 years), the most popular place of purchase was a supermarket (53%) [23]. Lack in the structure of the answer to this question

among teenagers from the South may be associated with less urbanised area in this part of the country.

Among young people with own survey, the most common choice of volume energy drink was the packaging of a 250 - 330 mL (55.5%) capacity and energy shots (60 - 75 mL, 14.7%). More than 12.0% of people that drunk energy drinks, chose the package half of litre. The most common, litre energy drink in the test group, chose 4.4% of adolescents. Pack of 1.5 litre or more energy drink purchased slightly more than half a percent of the participants in this study. Significant difference was observed between gender groups taking into account size of the packaging energy drink ($p < 0.0001$). Most of the boys (61.9%) selected beverages with a capacity of 250 - 330 mL in comparison girls (48.7%). Also litre packaging, energy drinks were more frequently selected by the boys (15.8% vs. 8.0%). Girls (20.9%) more often chose the smallest packaging than boys 8.9% from this research did. Also among the young people of the two provinces, most popular volume energy drink was packaging 250 - 330 mL (P: 49.2% vs. M: 60.9%). According to European research, on average, in the month of teen drinking rarely (34%) or 1 - 2 times a month (23%). Most drink can - 250 mL, on average, in the month of 2 - 4 cans. In single - dose half of the surveyed (51%) drinking one can of energy drink but already 4 and more cans or quart and more one-time energy drink drank 13% of the respondents [15]. Study Nowak and Jasionowskiego from the North of Poland, conducted in among young athletes also shows that most, young people chose to drink volume of cans - 250 mL (43%) [24].

The most popular brand of energy drink in the study population was produced in Poland drink Tiger (55.2%), followed by Red Bull (11.9%) and Energy (8.2%). The least popular brands of energy drinks were Power ON (1.1%), R20 + (0.5%) and Dominator (0.5%). Young people from Malopolska region more often chose the drink brand Tiger (64.9%) than their peers from Podkarpacie (43.3 $p < 0.0001$). Girls (60.2%) also more often were buying brand Tiger than boys (50.3% $p = 0.0037$). Also in previously conducted studies among adolescents from the Southern region of Poland the most popular brand was a Tiger (55.1%) and then behind it Red Bull (11.9%) [25], like in surveyed Nowak and Jasionowski [26]. In European studies among teenagers the most popular brand was Red Bull [15].

Studies have shown, that the respondents' decision to buy energy drink resisted mainly on price (15.4%) and the appearance of the beverage packaging (14.6%) and subsequently in popularity among peers energy drink (8.9%). The composition of the drink out drew 3.6% of respondents and on the taste of 2.6% of total study group. There was a significant statistics differences between gender group ($p = 0.0157$) in decision to buy energy drinks. The boys decided to choosing

energy drink more often resisted on the price of the drink (B: 19.2% vs. G: 11.5%) and beverage packaging (B: 18.2% vs. G: 10.9%). The youth of the Carpathian and from Galicia was significantly ($p = 0.0047$) in terms of decisive factor for choosing energy drink. For subjects with Malopolska region, quite an important factor was the popularity of the drink among peers (12.6%). While only 4.6% of the Carpathian chose this answer. Among students aged 19 - 26 years, flavor also was not the main criterion for buying energy drink (7.3%). Students mainly followed the price (45.3%), and the opinion of the manufacturer (35.3%) [27]. The flavour in survey from recent years in a group of adolescents from Podkarpacie, was the main reason to buy energy drinks (78.65%), price was important for 17.9% [25].

The abolition of the drowsy (44.2%) was the main reason for the purchase of energy drinks in the test group, and further extinguish slaking thirst (27.2%). Seem structure indicated in groups with respect to place of residence, where for reducing sleepiness after energy drinks reached 38.2% of the population of the Podkarpacie and 49% Malopolska region. The test group of boys and girls differ significantly in response to this question ($p = 0.0003$). Girls (52.3%) more often drunk energy drinks to reduce sleepiness than boys (36.8%). However, in order to improve the efficiency of physical, boys (21.2%) more often than girls (5.6%) reach for these drinks. The least selected reasons for application of energy drinks were: to improve the taste of alcoholic beverages (1.1%), increased mental performance (0.8%) and only 0.3% were on energy drinks because of improved memory. Among teens from Canada the most common reason was to stay awake or alert for driving (20.5%) or for studying/work (19.9%). Other reasons was taste a factor encouraging drinking en-

ergy drinks (26.3%) and for improving the efficiency of sports (14.9%). The desire to try something new be an attitude of young Canadians to buy energy drinks (41.9%) most, as high was the answer - my colleagues like them (28.0%) [22]. Adolescents from European country, also were mainly motivated, the taste that they like (40%) and in turn the need for energy (21%) or stay awake (17%) [15].

With purchasing energy drink in the school, investigated young people most often used less than once a week (45.8%), and never - 41.2% of respondents overall. Once a week, energy drinks in the school shop or the food/drinks purchased 7.9% of respondents. Currently it is not possible to buy energy drinks in Polish schools, and these results confirm the legitimacy of changes [14].

Daily (during one day) adolescents of the South Poland drunk, one can of energy drink (250 - 330 mL; 28.5%). In the group of a total of 1500 ml energy drink and more drunk - 8.5% of the respondents (Figure 1). Girls significantly more often saw smaller amounts of energy drinks a day ($p < 0.0001$) than boys. Most often a daily they drunk a can of energy drink (31.0%) as boys (26.4%) However, the boys often drunk their drinks with a volume of 500 mL (20.7%), 1,000 mL (20.7%) and 1,500 mL (11.9%). During the day young people from both provinces consumed up more often to 250 - 330 mL energy drink (P: 26.74% and M: 29.96%; Figure 2). One or less per day drunk 71.2% participants Reid *et al.*, studies, four or more cans of energy drinks - 4.3% [22]. The amount of consumed energy drinks by cans in Nowak and Jasionowski study was declared as 1 portion a day (44%). Having two portions a day declared the 12% of students from cited survey. 3 or 4 drinks were declared by 2 and 3% of respondents, respectively [26].

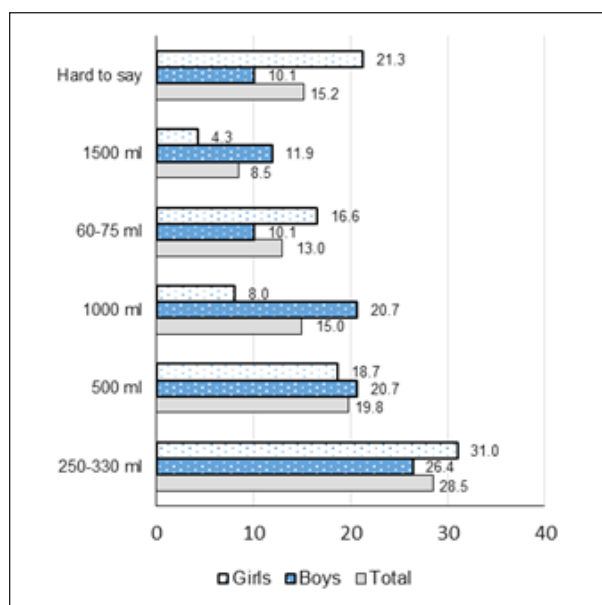


Figure 1. The largest amount of energy drink drunk for day in the total test group and gender

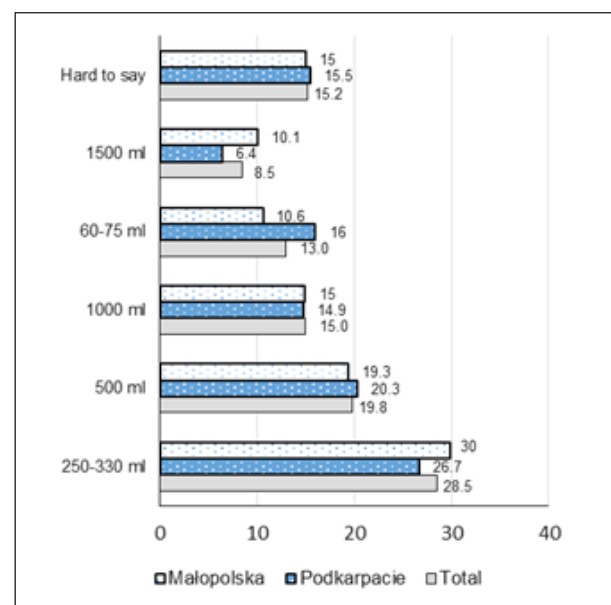


Figure 2. The largest amount of energy drink drunk throughout the day in total group and place of residence

The most common symptom after consuming energy drink in the population in own research was stimulation of the organism (42.0%). Insomnia was at 2.0%, and palpitations of heart in 8.5% of respondents. Other symptoms, which noted in youth group was shaking hands (8.0%), raised heart rate (7.0%) and pressure spikes (5.5%). The least common signs and symptoms were nausea (4.5%) and anxiety that occurred at 2.0% of the interviewees (Figure 3). A group of boys and girls do not differ in terms of the symptoms that occur after consuming energy drink ($p = 0.8355$). A group of residence also were not significantly different in terms of symptoms that occur after consuming energy drink ($p = 0.5518$). The most common symptom after consuming energy drink, among subjects with Podkarpackie (38.8%) and Malopolska region (45.1%), was to stimulate the body (Figure 4). In studies of Bashir *et al.*, in the group of adolescents aged 12 to 18 years, frequent energy drink consumers were more likely to report headache (76%), anger (47%), and increased urination (24%) and were more likely to require medical evaluation for headache (41%) and difficulty breathing (22%) [21]. Data from the Health Behaviour in School-aged Children Study conducted in 2014 in Slovakia in group of adolescents aged 11 - 15 years, show that adolescents who consumed energy drinks regularly had more health and behavioural problems such as feeling nervous (37.2%), irritability or bad temper (36.0%) and negative school experiences (59.0%) [28].

Reviews on the efficacy and safety of energy drinks have been collected in the following Table 2. According to respondents from the South Poland energy

drinks can be hazardous to their health (29.3%). More boys (32.2%) felt energy drinks hazardous to health - than girls (26.5%). Gender groups were statistically rating the effectiveness of energy drinks ($p = 0.0211$). Also was indicated a statistically significant differences in the assessment of the effectiveness of energy drinks by subjects from Podkarpackie and Malopolska region ($p = 0.0005$). Subjects from Malopolska, more pointed (37.7%) than youth from Podkarpacie region (20.1%), that these drinks are dangerous to health. About the effectiveness of energy drinks was convinced 5.7% from Podkarpacie and 5.6% from Galicia (Table 2). Kopicz *et al.*, considered 88.7% of study students considered as persons, which saw energy drinks effective. Among nondrinkers energy drinks, only half believed that they are effective and in opinion of 77.8% they can be hazardous to health [29].

In the opinion of 8.3%, energizing drinks are dangerous always, not regardless of the quantity consumed. About the absolute safety of the consumption of energy drinks believe was 3.1% of respondents of this survey. Most, almost 36.1%, unable to clearly assess the impact of energy drinks on the body (Table 2). For 9.1% of girls and only 4.4% of boys this kind of beverages are safe-if you rarely drink ($p = 0.0108$). In groups, because of the place of residence, no statistically significant differences in response to a question about the safety of energy drinks ($p = 0.2830$; Table 2). High school students from study Cichocki, as in own studies, also thought energy drinks dangerous always (about 10%), according to the opinion few students from the cited studies, they can be addictive [23].

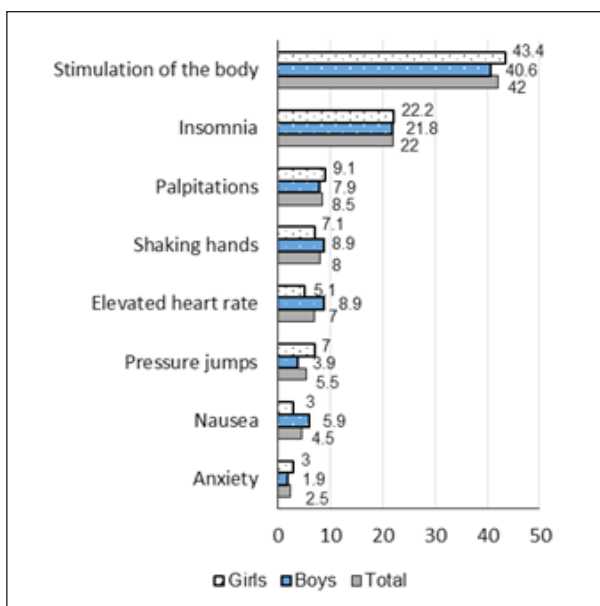


Figure 3. Frequency of symptoms after intake of energy drink in the study group taking into account gender of the respondents

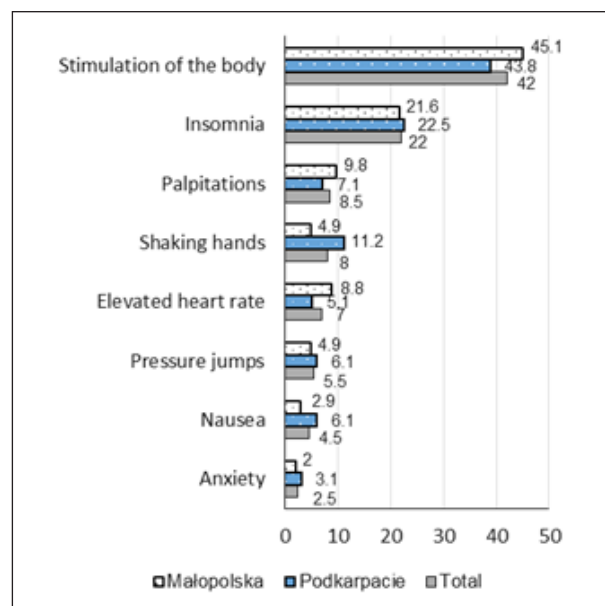


Figure 4. Frequency of symptoms after intake of energy drink in the study group taking into account place of residence

Table 2. Efficacy and safety of respondents in total and in groups, gender and place of residence [%]

Responses	Ogółem N = 409 [%]	Podkarpacie N = 194 [%]	Małopolska N = 215 [%]	Boys N = 205 [%]	Girls N = 204 [%]
Effectiveness of energy drinks					
Hard to say	38.6	39.7	37.7	41	36.3
Dangerous to health	29.3	20.1	37.7	32.2	26.5
Ineffective	16.1	21.6	11.2	11.2	21.1
Not very effective	10.3	12.9	7.9	8.3	12.3
Effective	5.6	5.7	5.6	7.3	3.9
Safety of energy drinks					
Not applicable	38.0	36.5	39.4	39.9	36.2
Hard to say	36.1	36.9	35.4	34	38.1
Dangerous	8.3	7.9	8.7	8.3	8.3
Dangerous if we drink a lot	7.7	10.4	5.4	7.9	7.6
Safe if we rarely drink	6.8	6.2	7.2	4.4	9.1
Safe always	3.1	2.1	4	5.5	0.8

N - number of participants

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4. Conclusions

- Boys and young people from the larger city, significantly more often drink energy drinks.

- The most common choice volume of energy drink by young people is 250 - 330 mL (can).

- The main reasons for the energy drinks by young people being investigated, is the abolition of sleepiness and extinguish slaking thirst, which may indicate a low knowledge about the destination of these drinks.

- Youth after drinking energy drinks reported often the stimulation of body.

- The majority of the surveyed believe energy drinks as hazardous to health and ineffective, while at the same time their pointing them at their safety depending on the dose consumed.

- Further education about energy drinks is need, because even though beliefs about their danger close to 23% drank a litre of energy drink and more in a single session.

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